



U.S. Environmental Protection Agency
Region 8
Technical and Management Services

Laboratory Services Program

Certificate of Analysis

Ref: 8TMS-L

MEMORANDUM

Date: 11/23/16

Subject: Analytical Results--- **Bonita Peaks_Water & Sed_OCT_2016_A129 / A-129**

From: Don Goodrich; EPA Region 8 Analytical Chemistry WAM

To: Rebecca Thomas
Superfund
1595 Wynkoop Street

Received Sample Set(s), [Work Order : Date Received]:

[C161023 : 09/30/2016]

Attached are the analytical results for the samples received from the Bonita Peaks_Water & Sed_OCT_2016_A129 sampling event, according to TDF A-129. All analyses were performed within their method specified holding times unless otherwise noted in the following narrative.

These samples were prepared, analyzed, and verified by the Environmental Services Assistance Team Laboratory (ESAT) according to the requirements of the Technical Direction Form (TDF).

Note: The laboratory herewith transmits this deliverable to the program/project partner for determination of "final data usability" which may include data validation and data quality assessment per and in accordance with EPA QA/G-8, *Guidance on Environmental Data Verification and Data Validation*, November 2002, EPA/240/R-02/004. Laboratory data qualifiers are applied based on the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004, referred to as "NFGI".

Laboratory policy is to dispose of any remaining sample 60 days after data analysis packages are delivered to EPA. If you would like the laboratory to retain the samples for a period longer than 60 days, please contact Don Goodrich within the 60 day period at (303) 312-6687.

Case Narrative**C161023**

Quality Assessment: Unless indicated by exception, the QA/QC associated with this sample set produced data within the TDF-specified criteria.

Holding Times: In batch 1611001, sediment samples were analyzed past hold for Hg analysis.

1. Initial and Continuing calibration blanks (ICBs and CCBs).
Exceptions: None.
2. Preparation (PB) / Method blanks (MB)
Exceptions: None.
3. Interference Checks (ICSA / ICSAB) for ICP-MS and ICP-OE analyses only.
Exceptions: None.
4. Initial and Continuing calibration verification analyses (ICVs, SCVs and CCVs).
Exceptions: None.
5. Laboratory Control Sample (LCS) or second source analysis or SRM.
Exceptions: In ICP-OE batch 1611124, iron recovered high in the SRM. All other QC requirements for iron were met.
6. Laboratory Fortified blank (LFB) / Blank spike (BS), same source as used for the matrix spikes.
PBS performed with analyses/methods requiring preparation or digestion prior to analysis.
Exceptions: None.
7. Contract Reporting Detection Limit Standard, labeled as CRA, CRDL or CRL.
Exceptions: None.
8. Laboratory Duplicate (DUP). "Source" identifies field sample duplicated in the laboratory. If either the "source" or the duplicate result is <5X the reporting limit, the %D limit of 20% does not apply.
Exceptions: None.
9. Laboratory Matrix Spike (MS) and spike duplicate (MSD). "Source" defines original field sample fortified prior to analysis. Percent recovery (%R) limits do not apply when sample concentration(s) exceed the corresponding analyte spike level by a factor of 4 or greater.
Exceptions: In ICP-MS batch 1611124, arsenic, selenium, antimony, and lead recovered outside acceptable limits in the MS. No qualifiers were assigned.
10. Serial Dilution sample analysis (SRD). "Source" is parent field sample diluted 1:5 in the laboratory.
Performed for ICP-OE and ICP-MS metals analyses. Percent difference (%D) limits do not apply when analyte concentration(s) are below 50x the source sample's MDL (or 10x its PQL).
Exceptions: In ICP-OE sequence 1611131, manganese recovered high in the SRD. As a result, the source sample was qualified "J" as estimated for manganese. In ICP-MS sequence 1611134, arsenic recovered high in the SRD. As a result, the source sample was qualified "J" as estimated for arsenic.
11. Internal standards, criteria specified for ICP-MS analyses only, monitored at the instrument.
Exceptions: None.
12. Any calibration using more than two-points produced a correlation coefficient equal to or greater than 0.995.
Exceptions: None.

Acronyms and Definitions:

ESAT	Environmental Services Assistance Team
J	Data Estimated qualifier (also applied to all data less than PQL, greater than or equal to MDL)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit, also known as reporting limit.
RPD	Relative Percent Difference (difference divided by the mean)
%D	Percent difference, serial dilution criteria unit, difference divided by the original result.
%R	Percent recovery, analyzed (less sample contribution) divided by true value
<	Analyte NOT DETECTED at or above the Method Detection Limit (MDL)
mg/L	Parts per million (milligrams per liter). Solids equivalent = mg/Kg.
ug/L	Parts per billion (micrograms per liter). Solids equivalent = ug/Kg.
NR	No Recovery (matrix spike) - Often seen for calcium/magnesium when their concentration exceeds the spike level by > 4x.
NFGI	USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
RE	Sample Re-analysis. Usually seen on raw data and sequences for required sample dilutions due to over-range analytes.
U	Analyte not detected at or above MDL qualifier
D	Diluted value qualifier.

Method(s) Summary:

As defined in the Technical Direction Form (TDF), some or all of the methods listed below were used for the determination of the reported target analytes.

From EPA's *Methods for the Determination of Metals in Environmental Samples*, Supplement I, May 1994, dissolved, total, and/or total recoverable metals were determined by:

- Method 200.7 / 6010B using a PE Optima ICP -OE (ICP).
- Method 200.8 / 6020 using a Perkin -Elmer Elan 6000 ICP-MS.
- Method 200.2 for total recoverable metals (only) digestion.
- Method 245.1 using a Perkin -Elmer FIMS CVAA (aqueous mercury only).

From *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 1992, Method 2340B was used for the calculated hardness determination. Hardness is reported as mg (milligram) equivalent CaCO₃ per liter (L) determined as follows:

$$\text{Calculated hardness} = 2.497 * (\text{Calcium, mg/L}) + 4.118 * (\text{Magnesium, mg/L}).$$

From EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW -846*,

- Method 3015A was used for microwave assisted total metals digestion.
- Method 7473 was used for mercury in solids .

From EPA's *Determination of Inorganic Anions by Ion Chromatography*, Revision 2.1, 1993, Method 300.0 was used to determine the anions.

From EPA's *Methods for Chemical Analysis of Water and Wastes*, March 1983:

- Method 310.1 was followed for the alkalinity determination.
- Method 160.1 was followed for gravimetric total dissolved solids (TDS) determination.
- Method 160.2 was used for gravimetric total suspended solids (TSS) determination.
- Method 415.3 was used for total organic carbon (TOC) determination using either an Apollo 9000 or Phoenix 8000 Non-Dispersive IR (NDIR) system. Also known as dissolved organic carbon (DOC) when performed on the dissolved sample fraction.

The quality control procedures listed in the TDF request were utilized by ESAT to verify accuracy of the results and to evaluate any matrix interferences.

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: A12 EPA Tag No.: 8-B		Date / Time Sampled: 09/28/16 09:57 Matrix: Water		Workorder: C161023 Lab Number: C161023-02 A					
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	341		ug/L	20.0	1	11/23/2016	SV	1611132
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Calcium	146000		ug/L	100	1	11/23/2016	SV	1611132
200.7	Iron	2250		ug/L	100	1	11/23/2016	SV	1611132
200.7	Magnesium	9410		ug/L	100	1	11/23/2016	SV	1611132
200.7	Manganese	13600		ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Silica (SiO2)	9940		ug/L	250	1	11/23/2016	SV	1611132
200.7	Strontium	823		ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Zinc	5050		ug/L	10.0	1	11/23/2016	SV	1611132
200.8	Antimony	2.45		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Arsenic	2.10		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Cadmium	5.11		ug/L	0.100	1	11/23/2016	SV	1611133
200.8	Chromium	1.56	J	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Copper	1.80		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Lead	< 0.200	U	ug/L	0.100	1	11/23/2016	SV	1611133
200.8	Nickel	1.92		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Selenium	1.12	J	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Silver	< 1.00	U	ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Thallium	< 2.00	U	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Uranium	< 0.200	U	ug/L	0.100	1	11/23/2016	SV	1611133
2340B	Hardness	403		mg/L	2	1	11/23/2016	SV	1611132

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: CC02D	Date / Time Sampled: 09/27/16 11:00	Workorder: C161023
EPA Tag No.: 8-B	Matrix: Water	Lab Number: C161023-05 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4040		ug/L	20.0	1	11/23/2016	SV	1611132
200.7	Beryllium	4.61	J	ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Calcium	215000		ug/L	100	1	11/23/2016	SV	1611132
200.7	Iron	26000		ug/L	100	1	11/23/2016	SV	1611132
200.7	Magnesium	13100		ug/L	100	1	11/23/2016	SV	1611132
200.7	Manganese	25100		ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Silica (SiO2)	32000		ug/L	250	1	11/23/2016	SV	1611132
200.7	Strontium	1860		ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Zinc	32200		ug/L	10.0	1	11/23/2016	SV	1611132
200.8	Antimony	< 1.00	U	ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Arsenic	2.58		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Cadmium	50.1		ug/L	0.100	1	11/23/2016	SV	1611133
200.8	Chromium	< 2.00	U	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Copper	16.5		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Lead	431		ug/L	0.100	1	11/23/2016	SV	1611133
200.8	Nickel	5.72		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Selenium	2.22		ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Silver	< 1.00	U	ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Thallium	< 2.00	U	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Uranium	0.178	J	ug/L	0.100	1	11/23/2016	SV	1611133
2340B	Hardness	591		mg/L	2	1	11/23/2016	SV	1611132

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	M12C	Date / Time Sampled:	09/29/16 08:51		Workorder:	C161023			
EPA Tag No.:	8-B	Matrix:	Water		Lab Number:	C161023-08 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	2920		ug/L	20.0	1	11/23/2016	SV	1611132
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Calcium	93700		ug/L	100	1	11/23/2016	SV	1611132
200.7	Iron	16300		ug/L	100	1	11/23/2016	SV	1611132
200.7	Magnesium	17500		ug/L	100	1	11/23/2016	SV	1611132
200.7	Manganese	6430		ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Silica (SiO2)	13200		ug/L	250	1	11/23/2016	SV	1611132
200.7	Strontium	2410		ug/L	2.00	1	11/23/2016	SV	1611132
200.7	Zinc	6060		ug/L	10.0	1	11/23/2016	SV	1611132
200.8	Antimony	< 1.00	U	ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Arsenic	1.63	J	ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Cadmium	18.7		ug/L	0.100	1	11/23/2016	SV	1611133
200.8	Chromium	1.18	J	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Copper	300		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Lead	20.7		ug/L	0.100	1	11/23/2016	SV	1611133
200.8	Nickel	11.8		ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Selenium	< 2.00	U	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Silver	< 1.00	U	ug/L	0.500	1	11/23/2016	SV	1611133
200.8	Thallium	< 2.00	U	ug/L	1.00	1	11/23/2016	SV	1611133
200.8	Uranium	0.568		ug/L	0.100	1	11/23/2016	SV	1611133
2340B	Hardness	306		mg/L	2	1	11/23/2016	SV	1611132

"J" Qualifier indicates an estimated value

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: A12 EPA Tag No.: 8-A		Date / Time Sampled: 09/28/16 09:57 Matrix: Water		Workorder: C161023 Lab Number: C161023-01 A					
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	362		ug/L	20.0	1	11/23/2016	SV	1611123
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Calcium	147000		ug/L	100	1	11/23/2016	SV	1611123
200.7	Iron	2420		ug/L	100	1	11/23/2016	SV	1611123
200.7	Magnesium	9410		ug/L	100	1	11/23/2016	SV	1611123
200.7	Manganese	13700		ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Silica (SiO2)	10000		ug/L	250	1	11/23/2016	SV	1611123
200.7	Strontium	835		ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Zinc	4990		ug/L	10.0	1	11/23/2016	SV	1611123
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Cadmium	5.44		ug/L	0.500	5	11/23/2016	SV	1611123
200.8	Chromium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Copper	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Lead	< 1.00	U	ug/L	0.500	5	11/23/2016	SV	1611123
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Selenium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Silver	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Thallium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Uranium	< 1.00	U	ug/L	0.500	5	11/23/2016	SV	1611123

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID:	A12	Date / Time Sampled:	09/28/16 09:57		Workorder:	C161023			
EPA Tag No.:	8-C	Matrix:	Sediment		Lab Number:	C161023-03 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	< 5050	U	ug/kg dry wt	2520	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Arsenic	61600		ug/kg dry wt	2520	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Cadmium	28400		ug/kg dry wt	505	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Chromium	< 10100	U	ug/kg dry wt	5050	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Copper	171000		ug/kg dry wt	2520	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Lead	271000		ug/kg dry wt	505	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Nickel	11900		ug/kg dry wt	2520	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Selenium	< 10100	U	ug/kg dry wt	5050	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Silver	< 5050	U	ug/kg dry wt	2520	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Thallium	< 10100	U	ug/kg dry wt	5050	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Uranium	2790		ug/kg dry wt	505	50	11/22/2016	SV	1611124
EPA 200.2/200.7	Aluminum	23700		mg/kg dry wt	20.2	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Beryllium	47.7		mg/kg dry wt	1.01	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Calcium	4420		mg/kg dry wt	101	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Iron	209000		mg/kg dry wt	101	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Magnesium	328		mg/kg dry wt	101	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Manganese	45600	J	mg/kg dry wt	2.02	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Silica (SiO2)	22300		mg/kg dry wt	252	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Strontium	46.1		mg/kg dry wt	2.02	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Zinc	12500		mg/kg dry wt	10.1	10	11/22/2016	SV	1611124

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID:	CC02D	Date / Time Sampled:	09/27/16 11:00		Workorder:	C161023			
EPA Tag No.:	8-A	Matrix:	Water		Lab Number:	C161023-04 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4050		ug/L	20.0	1	11/23/2016	SV	1611123
200.7	Beryllium	4.55	J	ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Calcium	213000		ug/L	100	1	11/23/2016	SV	1611123
200.7	Iron	26800		ug/L	100	1	11/23/2016	SV	1611123
200.7	Magnesium	13000		ug/L	100	1	11/23/2016	SV	1611123
200.7	Manganese	25300		ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Silica (SiO2)	31600		ug/L	250	1	11/23/2016	SV	1611123
200.7	Strontium	1890		ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Zinc	31500		ug/L	10.0	1	11/23/2016	SV	1611123
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Arsenic	2.94	J	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Cadmium	49.0		ug/L	0.500	5	11/23/2016	SV	1611123
200.8	Chromium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Copper	18.7		ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Lead	450		ug/L	0.500	5	11/23/2016	SV	1611123
200.8	Nickel	6.80		ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Selenium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Silver	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Thallium	7.74	J	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Uranium	< 1.00	U	ug/L	0.500	5	11/23/2016	SV	1611123

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID:	CC02D	Date / Time Sampled:	09/27/16 11:00		Workorder:	C161023			
EPA Tag No.:	8-C	Matrix:	Sediment		Lab Number:	C161023-06 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	< 19900	U	ug/kg dry wt	9950	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Arsenic	17800	J	ug/kg dry wt	9950	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Cadmium	< 3980	U	ug/kg dry wt	1990	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Chromium	< 39800	U	ug/kg dry wt	19900	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Copper	< 19900	U	ug/kg dry wt	9950	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Lead	68400		ug/kg dry wt	1990	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Nickel	< 19900	U	ug/kg dry wt	9950	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Selenium	< 39800	U	ug/kg dry wt	19900	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Silver	< 19900	U	ug/kg dry wt	9950	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Thallium	< 39800	U	ug/kg dry wt	19900	200	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Uranium	< 3980	U	ug/kg dry wt	1990	200	11/22/2016	SV	1611124
EPA 200.2/200.7	Aluminum	235		mg/kg dry wt	19.9	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Beryllium	< 4.98	U	mg/kg dry wt	0.995	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Calcium	549		mg/kg dry wt	99.5	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Iron	396000		mg/kg dry wt	99.5	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Magnesium	< 249	U	mg/kg dry wt	99.5	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Manganese	135		mg/kg dry wt	1.99	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Silica (SiO2)	2650		mg/kg dry wt	249	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Strontium	< 9.95	U	mg/kg dry wt	1.99	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Zinc	144		mg/kg dry wt	9.95	10	11/22/2016	SV	1611124

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: M12C
 EPA Tag No.: 8-A

Date / Time Sampled: 09/29/16 08:51
 Matrix: Water

Workorder: C161023
 Lab Number: C161023-07 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3620		ug/L	20.0	1	11/23/2016	SV	1611123
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Calcium	94700		ug/L	100	1	11/23/2016	SV	1611123
200.7	Iron	58800		ug/L	100	1	11/23/2016	SV	1611123
200.7	Magnesium	17700		ug/L	100	1	11/23/2016	SV	1611123
200.7	Manganese	6440		ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Silica (SiO2)	14200		ug/L	250	1	11/23/2016	SV	1611123
200.7	Strontium	2440		ug/L	2.00	1	11/23/2016	SV	1611123
200.7	Zinc	5780		ug/L	10.0	1	11/23/2016	SV	1611123
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Arsenic	39.3		ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Cadmium	19.1		ug/L	0.500	5	11/23/2016	SV	1611123
200.8	Chromium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Copper	348		ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Lead	116		ug/L	0.500	5	11/23/2016	SV	1611123
200.8	Nickel	12.9		ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Selenium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Silver	< 5.00	U	ug/L	2.50	5	11/23/2016	SV	1611123
200.8	Thallium	< 10.0	U	ug/L	5.00	5	11/23/2016	SV	1611123
200.8	Uranium	0.650	J	ug/L	0.500	5	11/23/2016	SV	1611123

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID:	M12C	Date / Time Sampled:	09/29/16 08:51		Workorder:	C161023			
EPA Tag No.:	8-C	Matrix:	Sediment		Lab Number:	C161023-09 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	< 5020	U	ug/kg dry wt	2510	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Arsenic	135000		ug/kg dry wt	2510	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Cadmium	886	J	ug/kg dry wt	502	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Chromium	< 10000	U	ug/kg dry wt	5020	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Copper	72400		ug/kg dry wt	2510	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Lead	1460000		ug/kg dry wt	502	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Nickel	< 5020	U	ug/kg dry wt	2510	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Selenium	< 10000	U	ug/kg dry wt	5020	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Silver	11100		ug/kg dry wt	2510	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Thallium	< 10000	U	ug/kg dry wt	5020	50	11/22/2016	SV	1611124
EPA 200.2 / 200.8	Uranium	< 1000	U	ug/kg dry wt	502	50	11/22/2016	SV	1611124
EPA 200.2/200.7	Aluminum	3500		mg/kg dry wt	20.1	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Beryllium	< 5.02	U	mg/kg dry wt	1.00	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Calcium	1130		mg/kg dry wt	100	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Iron	158000		mg/kg dry wt	100	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Magnesium	1200		mg/kg dry wt	100	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Manganese	511		mg/kg dry wt	2.01	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Silica (SiO ₂)	5050		mg/kg dry wt	251	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Strontium	27.7		mg/kg dry wt	2.01	10	11/22/2016	SV	1611124
EPA 200.2/200.7	Zinc	287		mg/kg dry wt	10.0	10	11/22/2016	SV	1611124

"J" Qualifier indicates an estimated value

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #:

A-129

Mercury only (Total) by EPA 245.1 / 7470A Method

Station ID: A12
EPA Tag No.: 8-C

Date / Time Sampled: 09/28/16 09:57
Matrix: Sediment

Workorder: C161023
Lab Number: C161023-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.106	J	mg/kg dry wt	0.024	1	11/03/2016	KJB	1611001

Mercury only (Total) by EPA 245.1 / 7470A Method

Station ID: CC02D
EPA Tag No.: 8-C

Date / Time Sampled: 09/27/16 11:00
Matrix: Sediment

Workorder: C161023
Lab Number: C161023-06 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	< 0.033	J U	mg/kg dry wt	0.016	1	11/03/2016	KJB	1611001

Mercury only (Total) by EPA 245.1 / 7470A Method

Station ID: M12C
EPA Tag No.: 8-C

Date / Time Sampled: 09/29/16 08:51
Matrix: Sediment

Workorder: C161023
Lab Number: C161023-09 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.089	J	mg/kg dry wt	0.010	1	11/03/2016	KJB	1611001

"J" Qualifier indicates an estimated value

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPMS-PE DRC-II									
Batch 1611133 - No Lab Prep Reqd		<i>Water</i>							ICPMS-PE DRC-II
Method Blank (1611133-BLK1)		Dilution Factor: 1							Prepared: 11/22/16 Analyzed: 11/23/16
Chromium	< 1.00	2.00	ug/L						
Nickel	< 0.500	1.00	"						
Copper	< 0.500	1.00	"						
Arsenic	< 0.500	2.00	"						
Selenium	< 1.00	2.00	"						
Silver	< 0.500	1.00	"						
Cadmium	< 0.100	0.200	"						
Antimony	< 0.500	1.00	"						
Thallium	< 1.00	2.00	"						
Lead	< 0.100	0.200	"						
Uranium	< 0.100	0.200	"						
Method Blank Spike (1611133-BS1)		Dilution Factor: 1							Prepared: 11/22/16 Analyzed: 11/23/16
Chromium	94.8	2.00	ug/L	100	95	85-115			
Nickel	93.5	1.00	"	100	93	85-115			
Copper	94.9	1.00	"	100	95	85-115			
Arsenic	91.3	2.00	"	100	91	85-115			
Selenium	507	2.00	"	500	101	85-115			
Silver	93.9	1.00	"	100	94	85-115			
Cadmium	98.4	0.200	"	100	98	85-115			
Antimony	104	1.00	"	100	104	85-115			
Thallium	91.8	2.00	"	100	92	85-115			
Lead	93.1	0.200	"	100	93	85-115			
Uranium	94.4	0.200	"	100	94	85-115			
Duplicate (1611133-DUP1)		Dilution Factor: 1		Source: C161023-02		Prepared: 11/22/16 Analyzed: 11/23/16			
Chromium	1.45	2.00	ug/L	1.56		8	20		
Nickel	1.66	1.00	"	1.92		14	20		
Copper	1.78	1.00	"	1.80		1	20		
Arsenic	1.98	2.00	"	2.10		6	20		
Selenium	< 1.00	2.00	"	1.12			20		
Silver	< 0.500	1.00	"	< 0.500			20		
Cadmium	5.17	0.200	"	5.11		1	20		
Antimony	< 0.500	1.00	"	2.45			20		
Thallium	< 1.00	2.00	"	< 1.00			20		
Lead	< 0.100	0.200	"	< 0.100			20		
Uranium	< 0.100	0.200	"	< 0.100			20		

TDF #: A-129

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611133 - No Lab Prep Reqd		<i>Water</i>						ICPMS-PE DRC-II	
Matrix Spike (1611133-MS1)		Dilution Factor: 1		Source: C161023-02			Prepared: 11/22/16 Analyzed: 11/23/16		
Chromium	88.9	2.00	ug/L	100	1.56	87	70-130		
Nickel	86.9	1.00	"	100	1.92	85	70-130		
Copper	86.9	1.00	"	100	1.80	85	70-130		
Arsenic	98.3	2.00	"	100	2.10	96	70-130		
Selenium	562	2.00	"	500	1.12	112	70-130		
Silver	90.8	1.00	"	100	< 0.500	91	70-130		
Cadmium	104	0.200	"	100	5.11	99	70-130		
Antimony	105	1.00	"	100	2.45	102	70-130		
Thallium	87.7	2.00	"	100	< 1.00	88	70-130		
Lead	89.0	0.200	"	100	< 0.100	89	70-130		
Uranium	92.9	0.200	"	100	< 0.100	93	70-130		
Batch 1611138 - 1611133		<i>Water</i>						ICPMS-PE DRC-II	
Serial Dilution (1611138-SRD1)		Dilution Factor: 5		Source: C161023-02			Prepared: 11/22/16 Analyzed: 11/23/16		
Chromium	< 5.00	10.0	ug/L		1.56				10
Nickel	< 2.50	5.00	"		1.92				10
Copper	< 2.50	5.00	"		1.80				10
Arsenic	< 2.50	10.0	"		2.10				10
Selenium	< 5.00	10.0	"		1.12				10
Silver	< 2.50	5.00	"		< 0.50				10
Cadmium	5.15	1.00	"		5.11			0.9	10
Antimony	< 2.50	5.00	"		2.45				10
Thallium	< 5.00	10.0	"		< 1.00				10
Lead	< 0.500	1.00	"		< 0.10				10
Uranium	< 0.500	1.00	"		< 0.10				10

TDF #: A-129

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
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ICPOE - PE Optima

Batch 1611132 - No Lab Prep Reqd

Water**ICPOE - PE Optima**

Method Blank (1611132-BLK1)		Dilution Factor: 1		Prepared: 11/22/16 Analyzed: 11/23/16					
Aluminum	< 20.0	50.0	ug/L						
Beryllium	< 2.00	5.00	"						
Calcium	< 100	250	"						
Iron	< 100	250	"						
Magnesium	< 100	250	"						
Manganese	< 2.00	5.00	"						
Strontium	< 2.00	10.0	"						
Zinc	< 10.0	20.0	"						
Silica (SiO2)	< 250	1000	"						

Method Blank Spike (1611132-BS1)		Dilution Factor: 1		Prepared: 11/22/16 Analyzed: 11/23/16					
Aluminum	10640	50.0	ug/L	10100	105	85-115			
Beryllium	100.8	5.00	"	100	101	85-115			
Calcium	10220	250	"	10100	101	85-115			
Iron	10410	250	"	10100	103	85-115			
Magnesium	10640	250	"	10100	105	85-115			
Manganese	95.33	5.00	"	100	95	85-115			
Strontium	552.3	10.0	"	500	110	85-115			
Zinc	100.1	20.0	"	100	100	85-115			
Silica (SiO2)	< 250	1000	"			85-115			

Duplicate (1611132-DUP1)		Dilution Factor: 1		Source: C161023-02		Prepared: 11/22/16 Analyzed: 11/23/16		
Aluminum	339.7	50.0	ug/L	340.6		0.3	20	
Beryllium	< 2.00	5.00	"	< 2.00			20	
Calcium	145800	250	"	145900		0.03	20	
Iron	2273	250	"	2253		0.9	20	
Magnesium	9455	250	"	9412		0.5	20	
Manganese	13740	5.00	"	13640		0.8	20	
Strontium	825.2	10.0	"	822.6		0.3	20	
Zinc	5040	20.0	"	5050		0.2	20	
Silica (SiO2)	10000	1000	"	9936		0.6	20	

TDF #: A-129

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611132 - No Lab Prep Reqd		Water						ICPOE - PE Optima	
Matrix Spike (1611132-MS1)		Dilution Factor: 1		Source: C161023-02		Prepared: 11/22/16 Analyzed: 11/23/16			
Aluminum	10910	50.0	ug/L	10100	340.6	105	70-130		
Beryllium	102.2	5.00	"	100	< 2.00	102	70-130		
Calcium	152000	250	"	10100	145900	61	70-130		
Iron	12470	250	"	10100	2253	101	70-130		
Magnesium	19670	250	"	10100	9412	102	70-130		
Manganese	13030	5.00	"	100	13640	NR	70-130		
Strontium	1351	10.0	"	500	822.6	106	70-130		
Zinc	4917	20.0	"	100	5050	NR	70-130		
Silica (SiO2)	9703	1000	"		9936		70-130		
Batch 1611136 - 1611132		Water						ICPOE - PE Optima	
Serial Dilution (1611136-SRD1)		Dilution Factor: 5		Source: C161023-02		Prepared: 11/22/16 Analyzed: 11/23/16			
Aluminum	325.2	250	ug/L		340.6		5	10	
Beryllium	< 10.0	25.0	"		< 2.00			10	
Calcium	139300	1250	"		145900		5	10	
Iron	2367	1250	"		2253		5	10	
Magnesium	9241	1250	"		9412		2	10	
Manganese	13680	25.0	"		13640		0.3	10	
Strontium	812.4	50.0	"		822.6		1	10	
Zinc	4875	100	"		5050		4	10	
Silica (SiO2)	9242	5000	"		9936		7	10	

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.

RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPMS-PE DRC-II									
Batch 1611123 - 200.2 - TR Metals							Water		
							ICPMS-PE DRC-II		
Method Blank (1611123-BLK2)		Dilution Factor: 5					Prepared: 11/22/16 Analyzed: 11/23/16		
Chromium	< 5.00	10.0	ug/L						
Nickel	< 2.50	5.00	"						
Copper	< 2.50	5.00	"						
Arsenic	< 2.50	10.0	"						
Selenium	< 5.00	10.0	"						
Silver	< 2.50	5.00	"						
Cadmium	< 0.500	1.00	"						
Antimony	< 2.50	5.00	"						
Thallium	< 5.00	10.0	"						
Lead	< 0.500	1.00	"						
Uranium	< 0.500	1.00	"						
Duplicate (1611123-DUP2)		Dilution Factor: 5		Source: C161023-01			Prepared: 11/22/16 Analyzed: 11/23/16		
Chromium	< 5.00	10.0	ug/L	< 5.00					20
Nickel	< 2.50	5.00	"	< 2.50					20
Copper	< 2.50	5.00	"	< 2.50					20
Arsenic	< 2.50	10.0	"	< 2.50					20
Selenium	< 5.00	10.0	"	< 5.00					20
Silver	< 2.50	5.00	"	< 2.50					20
Cadmium	4.998	1.00	"	5.439			8		20
Antimony	< 2.50	5.00	"	< 2.50					20
Thallium	< 5.00	10.0	"	< 5.00					20
Lead	< 0.500	1.00	"	< 0.500					20
Uranium	< 0.500	1.00	"	< 0.500					20
Matrix Spike (1611123-MS2)		Dilution Factor: 5		Source: C161023-01			Prepared: 11/22/16 Analyzed: 11/23/16		
Chromium	363.0	10.0	ug/L	400	< 5.00	91	70-130		
Nickel	454.4	5.00	"	500	< 2.50	91	70-130		
Copper	282.5	5.00	"	300	< 2.50	94	70-130		
Arsenic	746.5	10.0	"	800	< 2.50	93	70-130		
Selenium	2003	10.0	"	2000	< 5.00	100	70-130		
Silver	71.28	5.00	"	75.0	< 2.50	95	70-130		
Cadmium	199.7	1.00	"	200	5.439	97	70-130		
Antimony	847.8	5.00	"	800	< 2.50	106	70-130		
Thallium	1900	10.0	"	2000	< 5.00	95	70-130		
Lead	939.4	1.00	"	1000	< 0.500	94	70-130		
Uranium	119.0	1.00	"	100	< 0.500	119	70-130		

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611123 - 200.2 - TR Metals		<i>Water</i>						ICPMS-PE DRC-II	
Reference (1611123-SRM2)		Dilution Factor: 2						Prepared: 11/22/16 Analyzed: 11/23/16	
Chromium	964.9	40.0	ug/L	1000		96	85-115		
Nickel	940.2	20.0	"	1000		94	85-115		
Copper	977.0	20.0	"	1000		98	85-115		
Arsenic	1974	40.0	"	2000		99	85-115		
Selenium	1054	40.0	"	1000		105	85-115		
Silver	247.6	20.0	"	250		99	85-115		
Cadmium	1015	4.00	"	1000		102	85-115		
Antimony	2114	20.0	"	2000		106	85-115		
Thallium	4822	40.0	"	5000		96	85-115		
Lead	1949	4.00	"	2000		97	85-115		
Uranium	120.0	4.00	"	100		120	85-115		
Batch 1611124 - 200.2 - TR Metals		<i>Solid (dry wt basis)</i>						ICPMS-PE DRC-II	
Method Blank (1611124-BLK2)		Dilution Factor: 5						Prepared & Analyzed: 11/22/16	
Chromium	< 500	1000	ug/kg dry wt						
Nickel	< 250	500	"						
Copper	< 250	500	"						
Arsenic	< 250	1000	"						
Selenium	< 500	1000	"						
Silver	< 250	500	"						
Cadmium	< 50.0	100	"						
Antimony	< 250	500	"						
Thallium	< 500	1000	"						
Lead	< 50.0	100	"						
Uranium	< 50.0	100	"						

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611124 - 200.2 - TR Metals		<i>Solid (dry wt basis)</i>						ICPMS-PE DRC-II	
Duplicate (1611124-DUP2)		Dilution Factor: 5	Source: C161023-03			Prepared & Analyzed: 11/22/16			
Chromium	< 5060	10100	ug/kg dry wt	< 5060					35
Nickel	12100	5060	"	11920				1	35
Copper	171700	5060	"	171500				0.1	35
Arsenic	65490	10100	"	61580				6	35
Selenium	< 5060	10100	"	< 5060					35
Silver	< 2530	5060	"	< 2530					35
Cadmium	27030	1010	"	28450				5	35
Antimony	< 2530	5060	"	< 2530					35
Thallium	< 5060	10100	"	< 5060					35
Lead	278100	1010	"	271300				2	35
Uranium	2803	1010	"	2793				0.3	35
Matrix Spike (1611124-MS2)		Dilution Factor: 5	Source: C161023-03			Prepared & Analyzed: 11/22/16			
Chromium	36740	10100	ug/kg dry wt	40400	< 5060	91	70-130		
Nickel	59400	5060	"	50600	11920	94	70-130		
Copper	199500	5060	"	30300	171500	92	70-130		
Arsenic	109200	10100	"	80900	61580	59	70-130		
Selenium	93270	10100	"	202000	< 5060	46	70-130		
Silver	7512	5060	"	7580	< 2530	99	70-130		
Cadmium	44930	1010	"	20200	28450	82	70-130		
Antimony	40060	5060	"	80900	< 2530	50	70-130		
Thallium	178700	10100	"	202000	< 5060	88	70-130		
Lead	336600	1010	"	101000	271300	65	70-130		
Uranium	14040	1010	"	10100	2793	111	70-130		
Reference (1611124-SRM2)		Dilution Factor: 2							Prepared & Analyzed: 11/22/16
Chromium	95770	7790	ug/kg dry wt	96500		99	80-120		
Nickel	45270	3900	"	56800		80	76.5-123.4		
Copper	6165000	3900	"	6680000		92	80-120		
Arsenic	731800	7790	"	930000		79	65-134		
Selenium	35210	7790	"	37000		95	48-152		
Silver	18370	3900	"	20900		88	64-136		
Cadmium	41550	779	"	41600		100	77-123		
Antimony	217700	3900	"	213000		102	61-139		
Thallium	33130	7790	"	38100		87	64.5-135		
Lead	196600	779	"	224000		88	75-125		
Uranium	34140	779	"	39000		88	85-115		

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611134 - 1611124		<i>Solid (dry wt basis)</i>						ICPMS-PE DRC-II	
Serial Dilution (1611134-SRD1)		Dilution Factor: 2	Source: C161023-03			Prepared & Analyzed: 11/22/16			
Chromium	< 25200	50500	ug/kg dry wt		< 5,040.00				10
Nickel	< 12600	25200	"		11920				10
Copper	176100	25200	"		171500		3		10
Arsenic	69820	50500	"		61580		13		10
Selenium	< 25200	50500	"		< 5,040.00				10
Silver	< 12600	25200	"		< 2,520.00				10
Cadmium	28340	5050	"		28450		0.4		10
Antimony	< 12600	25200	"		< 2,520.00				10
Thallium	< 25200	50500	"		< 5,040.00				10
Lead	274700	5050	"		271300		1		10
Uranium	2670	5050	"		2793		5		10
Batch 1611139 - 1611123		<i>Water</i>						ICPMS-PE DRC-II	
Serial Dilution (1611139-SRD1)		Dilution Factor: 2	Source: C161023-01			Prepared: 11/22/16 Analyzed: 11/23/16			
Chromium	< 25.0	50.0	ug/L		< 5.00				10
Nickel	< 12.5	25.0	"		< 2.50				10
Copper	< 12.5	25.0	"		< 2.50				10
Arsenic	< 12.5	50.0	"		< 2.50				10
Selenium	< 25.0	50.0	"		< 5.00				10
Silver	< 12.5	25.0	"		< 2.50				10
Cadmium	5.094	5.00	"		5.439		7		10
Antimony	< 12.5	25.0	"		< 2.50				10
Thallium	< 25.0	50.0	"		< 5.00				10
Lead	< 2.50	5.00	"		< 0.50				10
Uranium	< 2.50	5.00	"		< 0.50				10

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Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
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ICPOE - PE Optima

Batch 1611123 - 200.2 - TR Metals

Water**ICPOE - PE Optima**

Method Blank (1611123-BLK1)		Dilution Factor: 1		Prepared: 11/22/16 Analyzed: 11/23/16					
Aluminum	< 20.0	50.0	ug/L						
Beryllium	< 2.00	5.00	"						
Calcium	< 100	250	"						
Iron	< 100	250	"						
Magnesium	< 100	250	"						
Manganese	< 2.00	5.00	"						
Silica (SiO2)	< 250	1000	"						
Zinc	< 10.0	20.0	"						
Strontium	< 2.00	10.0	"						

Duplicate (1611123-DUP1)		Dilution Factor: 1		Source: C161023-01		Prepared: 11/22/16 Analyzed: 11/23/16			
Aluminum	353.8	50.0	ug/L	362.1		2		20	
Beryllium	< 2.00	5.00	"	< 2.00				20	
Calcium	143700	250	"	146600		2		20	
Iron	2349	250	"	2417		3		20	
Magnesium	9197	250	"	9409		2		20	
Manganese	13650	5.00	"	13750		0.7		20	
Silica (SiO2)	10050	1000	"	10010		0.4		20	
Zinc	4939	20.0	"	4989		1		20	
Strontium	826.9	10.0	"	834.6		0.9		20	

Matrix Spike (1611123-MS1)		Dilution Factor: 1		Source: C161023-01		Prepared: 11/22/16 Analyzed: 11/23/16			
Aluminum	2353	50.0	ug/L	2000	362.1	100	70-130		
Beryllium	204.2	5.00	"	200	< 2.00	102	70-130		
Calcium	144700	250	"	1000	146600	NR	70-130		
Iron	5229	250	"	3000	2417	94	70-130		
Magnesium	11160	250	"	2000	9409	88	70-130		
Manganese	13380	5.00	"	200	13750	NR	70-130		
Silica (SiO2)	11640	1000	"	2000	10010	81	70-130		
Zinc	4933	20.0	"	200	4989	NR	70-130		
Strontium	1027	10.0	"	200	834.6	96	70-130		

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611123 - 200.2 - TR Metals		<i>Water</i>						ICPOE - PE Optima	
Reference (1611123-SRM1)		Dilution Factor: 1						Prepared: 11/22/16 Analyzed: 11/23/16	
Aluminum	1045	50.0	ug/L	1000		105	85-115		
Beryllium	1010	5.00	"	1000		101	85-115		
Calcium	1001	250	"	1000		100	85-115		
Iron	1049	250	"	1000		105	85-115		
Magnesium	1010	250	"	1000		101	85-115		
Manganese	988.5	5.00	"	1000		99	85-115		
Silica (SiO2)	4862	1000	"	5000		97	85-115		
Zinc	963.7	20.0	"	1000		96	85-115		
Strontium	1105	10.0	"	1000		110	85-115		
Batch 1611124 - 200.2 - TR Metals		<i>Solid (dry wt basis)</i>						ICPOE - PE Optima	
Method Blank (1611124-BLK1)		Dilution Factor: 1						Prepared & Analyzed: 11/22/16	
Aluminum	< 2.00	5.00	mg/kg dry wt						
Beryllium	< 0.100	0.500	"						
Calcium	< 10.0	25.0	"						
Iron	< 10.0	25.0	"						
Magnesium	< 10.0	25.0	"						
Manganese	< 0.200	0.500	"						
Silica (SiO2)	< 25.0	100	"						
Zinc	< 1.00	2.00	"						
Strontium	< 0.200	1.00	"						
Duplicate (1611124-DUP1)		Dilution Factor: 1	Source: C161023-03			Prepared & Analyzed: 11/22/16			
Aluminum	26352	50.6	mg/kg dry wt	23677			11	35	
Beryllium	48.808	5.06	"	47.669			2	35	
Calcium	4606.7	253	"	4417.5			4	35	
Iron	233220	253	"	208890			11	35	
Magnesium	329.80	253	"	327.69			0.6	35	
Manganese	45353	5.06	"	45587			0.5	35	
Silica (SiO2)	23309	1010	"	22292			4	35	
Zinc	12061	20.2	"	12504			4	35	
Strontium	46.480	10.1	"	46.113			0.8	35	

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611124 - 200.2 - TR Metals		<i>Solid (dry wt basis)</i>						ICPOE - PE Optima	
Matrix Spike (1611124-MS1)		Dilution Factor: 1		Source: C161023-03			Prepared & Analyzed: 11/22/16		
Aluminum	24394	50.6	mg/kg dry wt	202	23677	355	70-130		
Beryllium	70.303	5.06	"	20.2	47.669	112	70-130		
Calcium	4539.3	253	"	101	4417.5	120	70-130		
Iron	217580	253	"	303	208890	NR	70-130		
Magnesium	502.55	253	"	202	327.69	86	70-130		
Manganese	42130	5.06	"	20.2	45587	NR	70-130		
Silica (SiO2)	24245	1010	"	202	22292	966	70-130		
Zinc	12253	20.2	"	20.2	12504	NR	70-130		
Strontium	64.819	10.1	"	20.2	46.113	92	70-130		
Reference (1611124-SRM1)		Dilution Factor: 5		Prepared & Analyzed: 11/22/16					
Aluminum	421.67	48.7	mg/kg dry wt	309		136	63-137		
Beryllium	19.021	4.87	"	18.8		101	82-118		
Calcium	167250	244	"	184000		91	78-122		
Iron	16100	244	"	21000		77	80-120		
Magnesium	99830	244	"	113000		88	80-120		
Manganese	193.27	4.87	"	201		96	80-120		
Zinc	132.50	19.5	"	175		76	73-127		
Batch 1611131 - 1611124		<i>Solid (dry wt basis)</i>						ICPOE - PE Optima	
Serial Dilution (1611131-SRD1)		Dilution Factor: 5		Source: C161023-03			Prepared & Analyzed: 11/22/16		
Aluminum	23811	252	mg/kg dry wt		23677			0.6	10
Beryllium	47.647	25.2	"		47.669			0.05	10
Calcium	4406.0	1260	"		4417.5			0.3	10
Iron	215450	1260	"		208890			3	10
Magnesium	< 505	1260	"		327.69				10
Manganese	53467	25.2	"		45587			16	10
Silica (SiO2)	23478	5050	"		22292			5	10
Zinc	12701	101	"		12504			2	10
Strontium	45.754	50.5	"		46.113			0.8	10

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1611137 - 1611123		<i>Water</i>							ICPOE - PE Optima
Serial Dilution (1611137-SRD1)		Dilution Factor: 5	Source: C161023-01			Prepared: 11/22/16 Analyzed: 11/23/16			
Aluminum	359.6	250	ug/L		362.1		0.7	10	
Beryllium	< 10.0	25.0	"		< 2.00			10	
Calcium	144900	1250	"		146600		1	10	
Iron	2428	1250	"		2417		0.5	10	
Magnesium	9334	1250	"		9409		0.8	10	
Manganese	13900	25.0	"		13750		1	10	
Silica (SiO2)	9308	5000	"		10010		7	10	
Zinc	4906	100	"		4989		2	10	
Strontium	834.0	50.0	"		834.6		0.06	10	

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.
 RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

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Mercury only (Total) by EPA 245.1 / 7470A Method - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
NIC MA-3000									
Batch 1611001 - No Lab Prep Req'd			<i>Soil</i>						
Method Blank (1611001-BLK1)		Dilution Factor: 1						Prepared: 11/01/16 Analyzed: 11/03/16	
Mercury	< 0.010	0.020	mg/kg dry wt						
Duplicate (1611001-DUP1)		Dilution Factor: 1	Source: C161023-06			Prepared: 11/01/16 Analyzed: 11/03/16			
Mercury	0.0167	0.033	mg/kg dry wt		< 0.016				35
Matrix Spike (1611001-MS1)		Dilution Factor: 1	Source: C161023-06			Prepared: 11/01/16 Analyzed: 11/03/16			
Mercury	0.3179	0.033	mg/kg dry wt	0.328	< 0.016	97	80-120		
Matrix Spike Dup (1611001-MSD1)		Dilution Factor: 1	Source: C161023-06			Prepared: 11/01/16 Analyzed: 11/03/16			
Mercury	0.3290	0.033	mg/kg dry wt	0.328	< 0.016	100	80-120	3	20
Reference (1611001-SRM1)		Dilution Factor: 1				Prepared: 11/01/16 Analyzed: 11/03/16			
Mercury	8.005	0.239	mg/kg dry wt	6.45		124	75-125		

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.

RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

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INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 7473

Analysis Name: TM_Mercury 7473

Instrument: NIC MA-3000

Work Order: Nu C161023

Analytical Sequence: 1611023 **Total**

Concentration Units: mg/kg dry wt

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1611001-BLK1	NA	
Mercury	3.96	1.32	2.08			1.32	NA	0.02
		5	6	7	8			

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TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: EPA 200.2/200.7Analysis Name: ICPOE Tot. Rec. MetalsInstrument: ICPOE - PE OptimaWork Order: Nu C161023Analytical Sequence: 1611131 Total RecoverableConcentration Units: mg/kg dry wt

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
Aluminum	-1.22	1	2	3	4	1611124-BLK1	NA
		0.30				-2.27	NA
	0.30	5	6	7	8		
Beryllium	0.03	1	2	3	4	1611124-BLK1	NA
		-0.01				-0.01	NA
	0.03	5	6	7	8		
Calcium	0.97	1	2	3	4	1611124-BLK1	NA
		2.32				7.08	NA
	0.97	5	6	7	8		
Iron	1.93	1	2	3	4	1611124-BLK1	NA
		30.79				62.05	NA
	1.93	5	6	7	8		
Magnesium	0.09	1	2	3	4	1611124-BLK1	NA
		0.50				-0.02	NA
	0.09	5	6	7	8		
Manganese	0.04	1	2	3	4	1611124-BLK1	NA
		0.26				0.29	NA
	0.04	5	6	7	8		
Silica (SiO2)	-3.95	1	2	3	4	1611124-BLK1	NA
		27.50				-5.24	NA
	-3.95	5	6	7	8		
Zinc	0.63	1	2	3	4	1611124-BLK1	NA
		-0.91				0.59	NA
	0.63	5	6	7	8		

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INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: EPA 200.2/200.7Analysis Name: ICPOE Tot. Rec. MetalsInstrument: ICPOE - PE OptimaWork Order: Nu C161023Analytical Sequence: 1611131 Total RecoverableConcentration Units: mg/kg dry wt

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1611124-BLK1	NA	
Strontium	0.02	-0.01				0.01	NA	1.00
		5	6	7	8			

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: EPA 200.2 / 200.8Analysis Name: ICPMS Tot. Rec. MetalsInstrument: ICPMS-PE DRC-IIWork Order: Nu C161023Analytical Sequence: 1611134 Total RecoverableConcentration Units: ug/kg dry wt

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Chromium	-0.07	1	2	3	4	NA	1611124-BLK2	200.00
	-0.03	5	6	7	8	NA	0.22	
Nickel	0.03	1	2	3	4	NA	1611124-BLK2	100.00
	0.01	5	6	7	8	NA	-0.15	
Copper	0.00	1	2	3	4	NA	1611124-BLK2	100.00
	-0.01	5	6	7	8	NA	0.00	
Arsenic	0.07	1	2	3	4	NA	1611124-BLK2	200.00
	0.14	5	6	7	8	NA	-0.17	
Selenium	0.02	1	2	3	4	NA	1611124-BLK2	200.00
	0.15	5	6	7	8	NA	0.09	
Silver	0.01	1	2	3	4	NA	1611124-BLK2	100.00
	0.01	5	6	7	8	NA	0.01	
Cadmium	0.00	1	2	3	4	NA	1611124-BLK2	20.00
	0.00	5	6	7	8	NA	0.00	
Antimony	0.15	1	2	3	4	NA	1611124-BLK2	100.00
	0.25	5	6	7	8	NA	0.02	

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INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: EPA 200.2 / 200.8Analysis Name: ICPMS Tot. Rec. MetalsInstrument: ICPMS-PE DRC-IIWork Order: Nu C161023Analytical Sequence: 1611134 **Total Recoverable**Concentration Units: ug/kg dry wt

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Thallium	-0.03	1	2	3	4	NA	1611124-BLK2	200.00
		-0.03				NA	-0.09	
	0.02	5	6	7	8			
		1	2	3	4	NA	1611124-BLK2	
Lead	0.02	0.01				NA	0.02	20.00
		5	6	7	8			
	0.00	1	2	3	4	NA	1611124-BLK2	
		0.00				NA	0.00	
Uranium		5	6	7	8			

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INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.7Analysis Name: ICPOE Diss. MetalsInstrument: ICPOE - PE OptimaWork Order: Nu C161023Analytical Sequence: 1611136 **Dissolved**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
Aluminum	-0.73	1	2	3	4	1611132-BLK1	NA
	-1.19	5	6	7	8	-1.21	NA
Beryllium	0.11	1	2	3	4	1611132-BLK1	NA
	0.05	5	6	7	8	0.02	NA
Calcium	0.91	1	2	3	4	1611132-BLK1	NA
	0.15	5	6	7	8	0.87	NA
Iron	0.07	1	2	3	4	1611132-BLK1	NA
	26.90	5	6	7	8	34.06	NA
Magnesium	-0.04	1	2	3	4	1611132-BLK1	NA
	0.09	5	6	7	8	0.61	NA
Manganese	0.06	1	2	3	4	1611132-BLK1	NA
	0.06	5	6	7	8	0.00	NA
Strontium	0.04	1	2	3	4	1611132-BLK1	NA
	0.02	5	6	7	8	0.00	NA
Zinc	2.07	1	2	3	4	1611132-BLK1	NA
	2.26	5	6	7	8	1.46	NA

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Initial and Continuing Calibration Blanks

Analytical Method: 200.7Analysis Name: ICPOE Diss. MetalsInstrument: ICPOE - PE OptimaWork Order: Nu C161023Analytical Sequence: 1611136 **Dissolved**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1611132-BLK1	NA	
Silica (SiO ₂)	1.40	-2.40				1.52	NA	1,000.00
		5	6	7	8			

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INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.7Analysis Name: ICPOE Tot. Rec. MetalsInstrument: ICPOE - PE OptimaWork Order: Nu C161023Analytical Sequence: 1611137 **Total Recoverable**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
Aluminum	-0.73	1	2	3	4	1611123-BLK1	NA
		-1.19	-0.93				
		5	6	7	8	0.52	NA
Beryllium	0.11	1	2	3	4	1611123-BLK1	NA
		0.05	0.05				
		5	6	7	8	0.04	NA
Calcium	0.91	1	2	3	4	1611123-BLK1	NA
		0.15	2.01				
		5	6	7	8	-0.79	NA
Iron	0.07	1	2	3	4	1611123-BLK1	NA
		26.90	26.20				
		5	6	7	8	21.92	NA
Magnesium	-0.04	1	2	3	4	1611123-BLK1	NA
		0.09	0.15				
		5	6	7	8	-2.70	NA
Manganese	0.06	1	2	3	4	1611123-BLK1	NA
		0.06	0.04				
		5	6	7	8	0.22	NA
Silica (SiO2)	1.40	1	2	3	4	1611123-BLK1	NA
		-2.40	-1.53				
		5	6	7	8	9.26	NA
Zinc	2.07	1	2	3	4	1611123-BLK1	NA
		2.26	1.73				
		5	6	7	8	4.69	NA

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INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.7Analysis Name: ICPOE Tot. Rec. MetalsInstrument: ICPOE - PE OptimaWork Order: Nu C161023Analytical Sequence: 1611137 **Total Recoverable**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1611123-BLK1	NA	
Strontium	0.04	0.02	0.02			0.01	NA	10.00
		5	6	7	8			

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.8Analysis Name: ICPMS Diss. MetalsInstrument: ICPMS-PE DRC-IIWork Order: Nu C161023Analytical Sequence: 1611138 **Dissolved**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
Chromium	0.01	1	2	3	4	1611133-BLK1	NA
		-0.04				-0.02	NA
	-0.04	5	6	7	8		
Nickel	0.01	1	2	3	4	1611133-BLK1	NA
		-0.02				-0.11	NA
	-0.02	5	6	7	8		
Copper	0.01	1	2	3	4	1611133-BLK1	NA
		0.01				0.00	NA
	0.01	5	6	7	8		
Arsenic	-0.01	1	2	3	4	1611133-BLK1	NA
		0.02				0.16	NA
	-0.01	5	6	7	8		
Selenium	0.10	1	2	3	4	1611133-BLK1	NA
		-0.01				0.04	NA
	0.10	5	6	7	8		
Silver	0.01	1	2	3	4	1611133-BLK1	NA
		0.01				0.01	NA
	0.01	5	6	7	8		
Cadmium	0.00	1	2	3	4	1611133-BLK1	NA
		0.00				0.00	NA
	0.00	5	6	7	8		
Antimony	0.24	1	2	3	4	1611133-BLK1	NA
		0.21				0.17	NA
	0.24	5	6	7	8		

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #: A-129

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.8Analysis Name: ICPMS Diss. MetalsInstrument: ICPMS-PE DRC-IIWork Order: Nu C161023Analytical Sequence: 1611138 **Dissolved**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Thallium	0.01	1	2	3	4	1611133-BLK1	NA	2.00
		0.00						
	0.02	5	6	7	8	-0.02	NA	
Lead	0.02	1	2	3	4	1611133-BLK1	NA	0.20
		0.01						
		5	6	7	8	0.02	NA	
Uranium	0.00	1	2	3	4	1611133-BLK1	NA	0.20
		0.00						
		5	6	7	8	0.00	NA	

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.8Analysis Name: ICPMS Tot. Rec. MetalsInstrument: ICPMS-PE DRC-IIWork Order: Nu C161023Analytical Sequence: 1611139 **Total Recoverable**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL	
Chromium	0.01	1	2	3	4	NA	1611123-BLK2	2.00	
		-0.04	-0.03			NA	0.08		
		5	6	7	8				
Nickel	0.01	1	2	3	4	NA	1611123-BLK2	1.00	
		-0.02	0.02			NA	-0.13		
		5	6	7	8				
Copper	0.01	1	2	3	4	NA	1611123-BLK2	1.00	
		0.01	0.01			NA	0.00		
		5	6	7	8				
Arsenic	-0.01	1	2	3	4	NA	1611123-BLK2	2.00	
		0.02	0.09			NA	0.04		
		5	6	7	8				
Selenium	0.10	1	2	3	4	NA	1611123-BLK2	2.00	
		-0.01	-0.15			NA	-0.10		
		5	6	7	8				
Silver	0.01	1	2	3	4	NA	1611123-BLK2	1.00	
		0.01	0.01			NA	0.00		
		5	6	7	8				
Cadmium	0.00	1	2	3	4	NA	1611123-BLK2	0.20	
		0.00	0.00			NA	-0.01		
		5	6	7	8				
Antimony	0.24	1	2	3	4	NA	1611123-BLK2	1.00	
		0.21	0.22			NA	0.06		
		5	6	7	8				

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #: A-129

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Initial and Continuing Calibration Blanks

Analytical Method: 200.8Analysis Name: ICPMS Tot. Rec. MetalsInstrument: ICPMS-PE DRC-IIWork Order: Nu C161023Analytical Sequence: 1611139 **Total Recoverable**Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL	
		1	2	3	4	NA	1611123-BLK2		
Thallium	0.01	0.00	0.11			NA	-0.04	2.00	
		5	6	7	8				
	0.02	1	2	3	4	NA	0.01		
		0.01	0.01						
Lead	0.02	5	6	7	8	NA	0.01	0.20	
	0.00	1	2	3	4	NA	0.00		
		0.00	0.00						
Uranium	0.00	5	6	7	8	NA	0.00	0.20	

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results****NIC MA-3000**

Method: 7473

Analysis Name: TM_Mercury 7473

Sequence: 1611023

Work Order: C161023

Units: mg/kg dry wt

Total Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Mercury	100	98.32	98.3	1			2			3		
				100	117.2	117.2	100	107.0	107.0			
				4			5			6		
				7			8			9		

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results****ICPOE - PE Optima**

Method: EPA 200.2/200.7

Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1611131

Work Order: C161023

Units: mg/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	12500	12939	103.5	1			2			3		
				12500	13090	104.7						
				4			5			6		
				7			8			9		
				1			2			3		
				500	520.81	104.2						
				4			5			6		
Beryllium	500	517.06	103.4									
				7			8			9		
				1			2			3		
				12500	12657	101.3						
				4			5			6		
				7			8			9		
Calcium	12500	12663	101.3	1			2			3		
				12500	12657	101.3						
				4			5			6		
				7			8			9		
				1			2			3		
				12500	13068	104.5						
				4			5			6		
Iron	12500	12952	103.6									
				7			8			9		
				1			2			3		
				12500	13086	104.7						
				4			5			6		
				7			8			9		
Magnesium	12500	12964	103.7	1			2			3		
				12500	13086	104.7						
				4			5			6		
				7			8			9		
				1			2			3		
				1000	1044.5	104.5						
				4			5			6		
Manganese	1000	1038.6	103.9									
				7			8			9		

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results****ICPOE - PE Optima**

Method: EPA 200.2/200.7

Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1611131

Work Order: C161023

Units: mg/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Silica (SiO ₂)	10000	10315	103.2	1			2			3		
				10000	10326	103.3						
				4			5			6		
				7			8			9		
				1			2			3		
				500	519.63	103.9						
				4			5			6		
				7			8			9		
Strontium	500	514.84	103.0	1			2			3		
				500	519.63	103.9						
				4			5			6		
				7			8			9		
				1			2			3		
				2500	2624.9	105.0						
				4			5			6		
				7			8			9		
Zinc	2500	2608.1	104.3									
				1			2			3		

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results**

ICPMS-PE DRC-II

Method: EPA 200.2 / 200.8

Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1611134

Work Order: C161023

Units: ug/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	52.8	105.6	1			2			3		
				50.0	51.0	102.0						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	50.4	100.8						
				4			5			6		
Arsenic	50.0	50.3	100.6									
				7			8			9		
				1			2			3		
				50.0	50.4	100.8						
				4			5			6		
				7			8			9		
Cadmium	50.0	51.2	102.4	1			2			3		
				50.0	50.7	101.4						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	52.2	104.4						
				4			5			6		
Chromium	50.0	52.2	104.4									
				7			8			9		
				1			2			3		
				50.0	52.2	104.4						
				4			5			6		
				7			8			9		
Copper	50.0	52.6	105.2	1			2			3		
				50.0	54.3	108.6						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	49.8	99.6						
				4			5			6		
Lead	50.0	51.6	103.2									
				7			8			9		
				1			2			3		
				50.0	49.8	99.6						

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results**

ICPMS-PE DRC-II

Method: EPA 200.2 / 200.8

Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1611134

Work Order: C161023

Units: ug/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Nickel	50.0	51.6	103.2	1			2			3		
				50.0	52.0	104.0						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	51.3	102.6						
				4			5			6		
Selenium	50.0	51.2	102.4									
				7			8			9		
				1			2			3		
				50.0	50.7	101.4						
				4			5			6		
				7			8			9		
Silver	50.0	51.8	103.6	1			2			3		
				50.0	50.7	101.4						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	49.4	98.8						
				4			5			6		
Thallium	50.0	51.3	102.6									
				7			8			9		
				1			2			3		
				50.0	49.4	98.8						
				4			5			6		
				7			8			9		
Uranium	50.0	51.0	102.0	1			2			3		
				50.0	49.6	99.2						
				4			5			6		
				7			8			9		

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results****ICPOE - PE Optima**

Method: 200.7

Analysis Name: ICPOE Diss. Metals

Sequence: 1611136

Work Order: C161023

Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	12500	12760	102.1	1			2			3		
				12500	13100	104.8						
				4			5			6		
				7			8			9		
				1			2			3		
				500	515.3	103.1						
				4			5			6		
Beryllium	500	492.4	98.5									
				7			8			9		
				1			2			3		
				12500	12800	102.4						
				4			5			6		
				7			8			9		
Calcium	12500	12590	100.7	1			2			3		
				12500	12800	102.4						
				4			5			6		
				7			8			9		
				1			2			3		
				12500	13030	104.2						
				4			5			6		
Iron	12500	12720	101.8									
				7			8			9		
				1			2			3		
				12500	13160	105.3						
				4			5			6		
				7			8			9		
Magnesium	12500	12830	102.6	1			2			3		
				12500	13160	105.3						
				4			5			6		
				7			8			9		
				1			2			3		
				1000	1030	103.0						
				4			5			6		
Manganese	1000	985.7	98.6									
				7			8			9		
				1			2			3		

TechLaw, Inc. - ESAT Region 8											
Initial and Continuing Calibration Verification Results											
ICPOE - PE Optima			Method: 200.7			Analysis Name: ICPOE Diss. Metals					
Sequence: 1611136			Work Order: C161023			Units: ug/L					
Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)							
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found
Silica (SiO ₂)	10000	9870	98.7	1			2			3	
				10000	10420	104.2					
				4			5			6	
				7			8			9	
Strontium	500	511.6	102.3	1			2			3	
				500	529.6	105.9					
				4			5			6	
				7			8			9	
Zinc	2500	2495	99.8	1			2			3	
				2500	2584	103.4					
				4			5			6	
				7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima

Method: 200.7

Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1611137

Work Order: C161023

Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	12500	12760	102.1	1			2			3		
				12500	13100	104.8	12500	13180	105.4			
				4			5			6		
				7			8			9		
Beryllium	500	492.4	98.5	1			2			3		
				500	515.3	103.1	500	509.4	101.9			
				4			5			6		
				7			8			9		
Calcium	12500	12590	100.7	1			2			3		
				12500	12800	102.4	12500	12800	102.4			
				4			5			6		
				7			8			9		
Iron	12500	12720	101.8	1			2			3		
				12500	13030	104.2	12500	12870	103.0			
				4			5			6		
				7			8			9		
Magnesium	12500	12830	102.6	1			2			3		
				12500	13160	105.3	12500	13190	105.5			
				4			5			6		
				7			8			9		
Manganese	1000	985.7	98.6	1			2			3		
				1000	1030	103.0	1000	1013	101.3			
				4			5			6		
				7			8			9		

TechLaw, Inc. - ESAT Region 8											
Initial and Continuing Calibration Verification Results											
ICPOE - PE Optima			Method: 200.7			Analysis Name: ICPOE Tot. Rec. Metals					
Sequence: 1611137			Work Order: C161023			Units: ug/L					
Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)							
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found
Silica (SiO ₂)	10000	9870	98.7	1			2			3	
				10000	10420	104.2	10000	10250	102.5		
				4			5			6	
				7			8			9	
				1			2			3	
				500	529.6	105.9	500	536.5	107.3		
				4			5			6	
Strontium	500	511.6	102.3								
				7			8			9	
				1			2			3	
				2500	2584	103.4	2500	2518	100.7		
				4			5			6	
				7			8			9	
Zinc	2500	2495	99.8								
				1			2			3	
				2500	2518	100.7					
				4			5			6	
				7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results**

ICPMS-PE DRC-II

Method: 200.8

Analysis Name: ICPMS Diss. Metals

Sequence: 1611138

Work Order: C161023

Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	53.5	107.0	1			2			3		
				50.0	53.3	106.6						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	49.8	99.6						
				4			5			6		
Arsenic	50.0	50.2	100.4									
				7			8			9		
				1			2			3		
				50.0	52.0	104.0						
				4			5			6		
				7			8			9		
Cadmium	50.0	51.2	102.4	1			2			3		
				50.0	52.0	104.0						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	51.0	102.0						
				4			5			6		
Chromium	50.0	51.0	102.0									
				7			8			9		
				1			2			3		
				50.0	51.0	102.0						
				4			5			6		
				7			8			9		
Copper	50.0	51.3	102.6	1			2			3		
				50.0	51.3	102.6						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	50.7	101.4						
				4			5			6		
Lead	50.0	51.4	102.8									
				7			8			9		
				1			2			3		
				50.0	50.7	101.4						

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results**

ICPMS-PE DRC-II

Method: 200.8

Analysis Name: ICPMS Diss. Metals

Sequence: 1611138

Work Order: C161023

Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Nickel	50.0	50.1	100.2	1			2			3		
				50.0	49.7	99.4						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	51.2	102.4						
				4			5			6		
Selenium	50.0	52.5	105.0									
				7			8			9		
				1			2			3		
				50.0	51.2	102.4						
				4			5			6		
				7			8			9		
Silver	50.0	52.3	104.6	1			2			3		
				50.0	51.6	103.2						
				4			5			6		
				7			8			9		
				1			2			3		
				50.0	50.1	100.2						
				4			5			6		
Thallium	50.0	50.8	101.6									
				7			8			9		
				1			2			3		
				50.0	50.1	100.2						
				4			5			6		
				7			8			9		
Uranium	50.0	50.4	100.8	1			2			3		
				50.0	50.4	100.8						
				4			5			6		
				7			8			9		

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II

Method: 200.8

Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1611139

Work Order: C161023

Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	53.49	107.0	1			2			3		
				50.0	53.33	106.7	50.0	53.43	106.9			
				4			5			6		
				7			8			9		
Arsenic	50.0	50.23	100.5	1			2			3		
				50.0	49.80	99.6	50.0	49.31	98.6			
				4			5			6		
				7			8			9		
Cadmium	50.0	51.19	102.4	1			2			3		
				50.0	52.02	104.0	50.0	52.00	104.0			
				4			5			6		
				7			8			9		
Chromium	50.0	51.02	102.0	1			2			3		
				50.0	51.03	102.1	50.0	49.95	99.9			
				4			5			6		
				7			8			9		
Copper	50.0	51.28	102.6	1			2			3		
				50.0	51.31	102.6	50.0	50.31	100.6			
				4			5			6		
				7			8			9		
Lead	50.0	51.45	102.9	1			2			3		
				50.0	50.68	101.4	50.0	50.47	100.9			
				4			5			6		
				7			8			9		

TDF #: A-129

TechLaw, Inc. - ESAT Region 8**Initial and Continuing Calibration Verification Results**

ICPMS-PE DRC-II

Method: 200.8

Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1611139

Work Order: C161023

Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Nickel	50.0	50.06	100.1	1			2			3		
				50.0	49.72	99.4	50.0	49.43	98.9			
				4			5			6		
				7			8			9		
Selenium	50.0	52.45	104.9	1			2			3		
				50.0	51.22	102.4	50.0	50.37	100.7			
				4			5			6		
				7			8			9		
Silver	50.0	52.27	104.5	1			2			3		
				50.0	51.63	103.3	50.0	51.43	102.9			
				4			5			6		
				7			8			9		
Thallium	50.0	50.81	101.6	1			2			3		
				50.0	50.08	100.2	50.0	50.39	100.8			
				4			5			6		
				7			8			9		
Uranium	50.0	50.40	100.8	1			2			3		
				50.0	50.41	100.8	50.0	50.90	101.8			
				4			5			6		
				7			8			9		

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

TechLaw, Inc. - ESAT Region 8
ICP Interference Check Sample
ICPMS-PE DRC-II

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1611134	Analysis: ICPMS Tot. Rec. Metals					
Antimony	IFA1	0.1	ug/L			1.0
	IFB1	0.1	ug/L			1.0
Arsenic	IFA1	0.1	ug/L			2.0
	IFB1	20.3	ug/L	20	101	2.0
Cadmium	IFA1	0.0	ug/L			0.2
	IFB1	20.6	ug/L	20	103	0.2
Chromium	IFA1	0.2	ug/L			2.0
	IFB1	21.6	ug/L	20	108	2.0
Copper	IFA1	0.4	ug/L			1.0
	IFB1	21.9	ug/L	20	109	1.0
Lead	IFA1	0.0	ug/L			0.2
	IFB1	0.0	ug/L			0.2
Nickel	IFA1	-0.4	ug/L			1.0
	IFB1	20.3	ug/L	20	101	1.0
Selenium	IFA1	0.0	ug/L			2.0
	IFB1	-0.2	ug/L			2.0
Silver	IFA1	0.0	ug/L			1.0
	IFB1	20.0	ug/L	20	100	1.0
Thallium	IFA1	-0.1	ug/L			2.0
	IFB1	-0.1	ug/L			2.0
Uranium	IFA1	0.0	ug/L			0.2
	IFB1	0.0	ug/L			0.2

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

TechLaw, Inc. - ESAT Region 8
ICP Interference Check Sample
ICPMS-PE DRC-II

<u>Analyte</u>	<u>Check Sample</u>	<u>Result*</u>	<u>Units</u>	<u>True</u>	<u>%R</u>	<u>PQL</u>
Sequence: 1611138	Analysis: ICPMS Diss. Metals					
Antimony	IFA1	0.2	ug/L			1.00
	IFB1	0.1	ug/L			1.00
Arsenic	IFA1	0.1	ug/L			2.00
	IFB1	20.4	ug/L	20	102	2.00
Cadmium	IFA1	0.1	ug/L			0.200
	IFB1	20.5	ug/L	20	102	0.200
Chromium	IFA1	0.2	ug/L			2.00
	IFB1	20.6	ug/L	20	103	2.00
Copper	IFA1	0.4	ug/L			1.00
	IFB1	20.6	ug/L	20	103	1.00
Lead	IFA1	0.0	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Nickel	IFA1	-0.3	ug/L			1.00
	IFB1	20.0	ug/L	20	100	1.00
Selenium	IFA1	-0.1	ug/L			2.00
	IFB1	-0.2	ug/L			2.00
Silver	IFA1	0.0	ug/L			1.00
	IFB1	20.0	ug/L	20	100	1.00
Thallium	IFA1	0.0	ug/L			2.00
	IFB1	0.0	ug/L			2.00
Uranium	IFA1	0.0	ug/L			0.200
	IFB1	0.0	ug/L			0.200

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

TechLaw, Inc. - ESAT Region 8
ICP Interference Check Sample
ICPMS-PE DRC-II

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1611139	Analysis: ICPMS Tot. Rec. Metals					
Antimony	IFA1	0.2	ug/L			1.00
	IFB1	0.1	ug/L			1.00
Arsenic	IFA1	0.1	ug/L			2.00
	IFB1	20.4	ug/L	20	102	2.00
Cadmium	IFA1	0.1	ug/L			0.200
	IFB1	20.5	ug/L	20	102	0.200
Chromium	IFA1	0.2	ug/L			2.00
	IFB1	20.6	ug/L	20	103	2.00
Copper	IFA1	0.4	ug/L			1.00
	IFB1	20.6	ug/L	20	103	1.00
Lead	IFA1	0.0	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Nickel	IFA1	-0.3	ug/L			1.00
	IFB1	20.0	ug/L	20	100	1.00
Selenium	IFA1	-0.1	ug/L			2.00
	IFB1	-0.2	ug/L			2.00
Silver	IFA1	0.0	ug/L			1.00
	IFB1	20.0	ug/L	20	100	1.00
Thallium	IFA1	0.0	ug/L			2.00
	IFB1	0.0	ug/L			2.00
Uranium	IFA1	0.0	ug/L			0.200
	IFB1	0.0	ug/L			0.200

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

TechLaw, Inc. - ESAT Region 8
ICP Interference Check Sample
ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1611131	Analysis: ICPOE Tot. Rec. Metals					
Aluminum	IFA1	61,791.5	ug/L	60,000	103	50.0
	IFB1	62,233.4	ug/L	60,000	104	50.0
Beryllium	IFA1	-0.5	ug/L			5.00
	IFB1	102.2	ug/L	100	102	5.00
Calcium	IFA1	292,569.6	ug/L	300,000	98	250
	IFB1	296,018.9	ug/L	300,000	99	250
Iron	IFA1	231,256.0	ug/L	250,000	93	250
	IFB1	232,747.1	ug/L	250,000	93	250
Magnesium	IFA1	143,915.6	ug/L	150,000	96	250
	IFB1	144,769.7	ug/L	150,000	97	250
Manganese	IFA1	1.2	ug/L			5.00
	IFB1	195.4	ug/L	200	98	5.00
Silica (SiO2)	IFA1	6.9	ug/L			1000
	IFB1	534.2	ug/L	500	107	1000
Strontium	IFA1	-5.9	ug/L			10.0
	IFB1	1,008.7	ug/L	1,000	101	10.0
Zinc	IFA1	-4.3	ug/L			20.0
	IFB1	283.7	ug/L	300	95	20.0

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

TechLaw, Inc. - ESAT Region 8
ICP Interference Check Sample
ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1611136	Analysis: ICPOE Diss. Metals					
Aluminum	IFA1	62,425.4	ug/L	60,000	104	50.0
	IFB1	62,366.9	ug/L	60,000	104	50.0
Beryllium	IFA1	-0.5	ug/L			5.00
	IFB1	95.6	ug/L	100	96	5.00
Calcium	IFA1	294,498.0	ug/L	300,000	98	250
	IFB1	296,292.4	ug/L	300,000	99	250
Iron	IFA1	232,841.5	ug/L	250,000	93	250
	IFB1	232,566.9	ug/L	250,000	93	250
Magnesium	IFA1	146,446.6	ug/L	150,000	98	250
	IFB1	146,200.1	ug/L	150,000	97	250
Manganese	IFA1	1.0	ug/L			5.00
	IFB1	183.1	ug/L	200	92	5.00
Silica (SiO2)	IFA1	5.8	ug/L			1000
	IFB1	512.7	ug/L	500	103	1000
Strontium	IFA1	-5.8	ug/L			10.0
	IFB1	1,033.0	ug/L	1,000	103	10.0
Zinc	IFA1	-2.8	ug/L			20.0
	IFB1	275.0	ug/L	300	92	20.0

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

TechLaw, Inc. - ESAT Region 8
ICP Interference Check Sample
ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1611137	Analysis: ICPOE Tot. Rec. Metals					
Aluminum	IFA1	62,425.4	ug/L	60,000	104	50.0
	IFB1	62,366.9	ug/L	60,000	104	50.0
Beryllium	IFA1	-0.5	ug/L			5.00
	IFB1	95.6	ug/L	100	96	5.00
Calcium	IFA1	294,498.0	ug/L	300,000	98	250
	IFB1	296,292.4	ug/L	300,000	99	250
Iron	IFA1	232,841.5	ug/L	250,000	93	250
	IFB1	232,566.9	ug/L	250,000	93	250
Magnesium	IFA1	146,446.6	ug/L	150,000	98	250
	IFB1	146,200.1	ug/L	150,000	97	250
Manganese	IFA1	1.0	ug/L			5.00
	IFB1	183.1	ug/L	200	92	5.00
Silica (SiO2)	IFA1	5.8	ug/L			1000
	IFB1	512.7	ug/L	500	103	1000
Strontium	IFA1	-5.8	ug/L			10.0
	IFB1	1,033.0	ug/L	1,000	103	10.0
Zinc	IFA1	-2.8	ug/L			20.0
	IFB1	275.0	ug/L	300	92	20.0

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPMS-PE DRC-II

Metals (Dissolved) by EPA 200/7000 Series Methods

Sequence: 1611138

<u>Analyte</u>	<u>True</u>	<u>Found</u>	<u>%R</u>	<u>Units</u>
Antimony	1.00	1.17	117	ug/L
Arsenic	2.00	1.96	98	ug/L
Cadmium	0.200	0.199	99	ug/L
Chromium	2.00	1.97	99	ug/L
Copper	1.00	1.16	116	ug/L
Lead	0.200	0.213	107	ug/L
Nickel	1.00	0.889	89	ug/L
Selenium	2.00	2.12	106	ug/L
Silver	1.00	0.979	98	ug/L
Thallium	1.00	0.874	87	ug/L
Uranium	0.200	0.183	91	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPOE - PE Optima

Metals (Dissolved) by EPA 200/7000 Series Methods

Sequence: 1611136

Analyte	True	Found	%R	Units
Aluminum	100	102.2	102	ug/L
Beryllium	5.00	5.144	103	ug/L
Calcium	250	252.0	101	ug/L
Iron	100	120.9	121	ug/L
Magnesium	1000	1036	104	ug/L
Manganese	10.0	10.06	101	ug/L
Silica (SiO2)	250	252.2	101	ug/L
Strontium	10.0	10.77	108	ug/L
Zinc	50.0	53.03	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

TDF #: A-129

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
NIC MA-3000

Mercury only (Total) by EPA 245.1 / 7470A Method

Sequence: 1611023

<u>Analyte</u>	<u>True</u>	<u>Found</u>	<u>%R</u>	<u>Units</u>
Mercury	10.0	13.02	130	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPMS-PE DRC-II

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1611134

<u>Analyte</u>	<u>True</u>	<u>Found</u>	<u>%R</u>	<u>Units</u>
Antimony	1.00	1.1	106	ug/L
Arsenic	2.00	2.0	101	ug/L
Cadmium	0.200	0.2	105	ug/L
Chromium	2.00	1.9	96	ug/L
Copper	1.00	1.1	108	ug/L
Lead	0.200	0.2	104	ug/L
Nickel	1.00	0.9	87	ug/L
Selenium	2.00	2.4	122	ug/L
Silver	1.00	1.0	97	ug/L
Thallium	1.00	0.9	88	ug/L
Uranium	0.200	0.2	94	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPMS-PE DRC-II

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1611139

<u>Analyte</u>	<u>True</u>	<u>Found</u>	<u>%R</u>	<u>Units</u>
Antimony	1.00	1.169	117	ug/L
Arsenic	2.00	1.956	98	ug/L
Cadmium	0.200	0.1988	99	ug/L
Chromium	2.00	1.975	99	ug/L
Copper	1.00	1.161	116	ug/L
Lead	0.200	0.2132	107	ug/L
Nickel	1.00	0.8889	89	ug/L
Selenium	2.00	2.116	106	ug/L
Silver	1.00	0.9794	98	ug/L
Thallium	1.00	0.8736	87	ug/L
Uranium	0.200	0.1830	91	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPOE - PE Optima

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1611131

Analyte	True	Found	%R	Units
Aluminum	100	101.71	102	ug/L
Beryllium	5.00	5.2227	104	ug/L
Calcium	250	253.52	101	ug/L
Iron	100	88.825	89	ug/L
Magnesium	1000	1028.9	103	ug/L
Manganese	10.0	10.374	104	ug/L
Silica (SiO2)	250	256.12	102	ug/L
Strontium	10.0	10.597	106	ug/L
Zinc	50.0	51.572	103	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPOE - PE Optima

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1611137

Analyte	True	Found	%R	Units
Aluminum	100	102.2	102	ug/L
Beryllium	5.00	5.144	103	ug/L
Calcium	250	252.0	101	ug/L
Iron	100	120.9	121	ug/L
Magnesium	1000	1036	104	ug/L
Manganese	10.0	10.06	101	ug/L
Silica (SiO2)	250	252.2	101	ug/L
Strontium	10.0	10.77	108	ug/L
Zinc	50.0	53.03	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #:

A-129

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 7473

Total

Sequence ID#: 1611023

Instrument ID #: NIC MA-3000

Soil

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611023-ICV1	Initial Cal Check	11/03/16	10:45
1611023-ICB1	Initial Cal Blank	11/03/16	10:45
1611023-CRL1	Instrument RL Check	11/03/16	10:45
1611001-BLK1	Blank	11/03/16	10:45
1611001-SRM1	Reference	11/03/16	10:45
C161023-03	A12	11/03/16	10:45
C161023-06	CC02D	11/03/16	10:45
1611001-DUP1	Duplicate	11/03/16	10:45
1611001-MS1	Matrix Spike	11/03/16	10:45
1611001-MSD1	Matrix Spike Dup	11/03/16	10:45
1611023-CCV1	Calibration Check	11/03/16	10:45
1611023-CCB1	Calibration Blank	11/03/16	10:45
C161023-09	M12C	11/03/16	10:45
1611023-CCV2	Calibration Check	11/03/16	10:45
1611023-CCB2	Calibration Blank	11/03/16	10:45

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #:

A-129

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: EPA 200.2/200.7

Total Recoverable

Sequence ID#: 1611131

Instrument ID #: ICPOE - PE Optima

Solid (dry wt basis)

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611131-ICV1	Initial Cal Check	11/22/16	13:00
1611131-SCV1	Secondary Cal Check	11/22/16	13:04
1611131-ICB1	Initial Cal Blank	11/22/16	13:07
1611131-CRL1	Instrument RL Check	11/22/16	13:10
1611131-IFA1	Interference Check A	11/22/16	13:12
1611131-IFB1	Interference Check B	11/22/16	13:16
1611124-BLK1	Blank	11/22/16	13:20
1611124-SRM1	Reference	11/22/16	13:23
C161023-03	A12	11/22/16	13:26
1611124-DUP1	Duplicate	11/22/16	13:30
1611131-SRD1	Serial Dilution	11/22/16	13:34
1611124-MS1	Matrix Spike	11/22/16	13:37
C161023-06	CC02D	11/22/16	13:42
C161023-09	M12C	11/22/16	13:45
1611131-CCV1	Calibration Check	11/22/16	13:51
1611131-CCB1	Calibration Blank	11/22/16	13:54

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #:

A-129

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: EPA 200.2 / 200.8

Total Recoverable

Sequence ID#: 1611134

Instrument ID #: ICPMS-PE DRC-II

Solid (dry wt basis)

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611134-ICV1	Initial Cal Check	11/22/16	13:23
1611134-SCV1	Secondary Cal Check	11/22/16	13:26
1611134-ICB1	Initial Cal Blank	11/22/16	13:29
1611134-CRL1	Instrument RL Check	11/22/16	13:33
1611134-IFA1	Interference Check A	11/22/16	13:36
1611134-IFB1	Interference Check B	11/22/16	13:39
1611124-BLK2	Blank	11/22/16	13:43
C161023-03	A12	11/22/16	13:54
1611124-DUP2	Duplicate	11/22/16	13:57
1611134-SRD1	Serial Dilution	11/22/16	14:00
1611124-SRM2	Reference	11/22/16	14:03
1611124-MS2	Matrix Spike	11/22/16	14:06
C161023-09	M12C	11/22/16	14:13
C161023-06	CC02D	11/22/16	14:23
1611134-CCV1	Calibration Check	11/22/16	14:26
1611134-CCB1	Calibration Blank	11/22/16	14:30

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.7

Dissolved

Sequence ID#: 1611136

Instrument ID #: ICPOE - PE Optima

Water

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611136-ICV1	Initial Cal Check	11/23/16	08:05
1611136-SCV1	Secondary Cal Check	11/23/16	08:08
1611136-ICB1	Initial Cal Blank	11/23/16	08:11
1611136-CRL1	Instrument RL Check	11/23/16	08:14
1611136-IFA1	Interference Check A	11/23/16	08:17
1611136-IFB1	Interference Check B	11/23/16	08:21
1611132-BLK1	Blank	11/23/16	08:25
1611132-BS1	Blank Spike	11/23/16	08:28
C161023-02	A12	11/23/16	08:31
1611132-DUP1	Duplicate	11/23/16	08:34
1611136-SRD1	Serial Dilution	11/23/16	08:37
1611132-MS1	Matrix Spike	11/23/16	08:40
C161023-05	CC02D	11/23/16	08:43
C161023-08	M12C	11/23/16	08:47
1611136-CCV1	Calibration Check	11/23/16	08:53
1611136-CCB1	Calibration Blank	11/23/16	08:57

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.7

Total Recoverable

Sequence ID#: 1611137

Instrument ID #: ICPOE - PE Optima

Water

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611137-ICV1	Initial Cal Check	11/23/16	08:05
1611137-SCV1	Secondary Cal Check	11/23/16	08:08
1611137-ICB1	Initial Cal Blank	11/23/16	08:11
1611137-CRL1	Instrument RL Check	11/23/16	08:14
1611137-IFA1	Interference Check A	11/23/16	08:17
1611137-IFB1	Interference Check B	11/23/16	08:21
1611137-CCV1	Calibration Check	11/23/16	08:53
1611137-CCB1	Calibration Blank	11/23/16	08:57
1611123-BLK1	Blank	11/23/16	09:02
1611123-SRM1	Reference	11/23/16	09:05
C161023-01	A12	11/23/16	09:08
1611123-DUP1	Duplicate	11/23/16	09:11
1611137-SRD1	Serial Dilution	11/23/16	09:14
1611123-MS1	Matrix Spike	11/23/16	09:17
C161023-04	CC02D	11/23/16	09:20
C161023-07	M12C	11/23/16	09:24
1611137-CCV2	Calibration Check	11/23/16	09:33
1611137-CCB2	Calibration Blank	11/23/16	09:37

Project Name: Bonita Peaks_Water & Sed_OCT_2016_A129

Certificate of Analysis

TDF #:

A-129

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.8

Dissolved

Sequence ID#: 1611138

Instrument ID #: ICPMS-PE DRC-II

Water

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611138-ICV1	Initial Cal Check	11/23/16	08:43
1611138-SCV1	Secondary Cal Check	11/23/16	08:46
1611138-ICB1	Initial Cal Blank	11/23/16	08:49
1611138-CRL1	Instrument RL Check	11/23/16	08:53
1611138-IFA1	Interference Check A	11/23/16	08:56
1611138-IFB1	Interference Check B	11/23/16	08:59
1611133-BLK1	Blank	11/23/16	09:02
1611133-BS1	Blank Spike	11/23/16	09:06
C161023-02	A12	11/23/16	09:09
1611133-DUP1	Duplicate	11/23/16	09:12
1611138-SRD1	Serial Dilution	11/23/16	09:15
1611133-MS1	Matrix Spike	11/23/16	09:18
C161023-05	CC02D	11/23/16	09:21
C161023-08	M12C	11/23/16	09:24
1611138-CCV1	Calibration Check	11/23/16	09:30
1611138-CCB1	Calibration Blank	11/23/16	09:33

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.8

Total Recoverable

Sequence ID#: 1611139

Instrument ID #: ICPMS-PE DRC-II

Water

LSR #: A-129

Analysis ID	Sample Name	Analysis Date	Analysis Time
1611139-ICV1	Initial Cal Check	11/23/16	08:43
1611139-SCV1	Secondary Cal Check	11/23/16	08:46
1611139-ICB1	Initial Cal Blank	11/23/16	08:49
1611139-CRL1	Instrument RL Check	11/23/16	08:53
1611139-IFA1	Interference Check A	11/23/16	08:56
1611139-IFB1	Interference Check B	11/23/16	08:59
1611139-CCV1	Calibration Check	11/23/16	09:30
1611139-CCB1	Calibration Blank	11/23/16	09:33
1611123-BLK2	Blank	11/23/16	09:38
C161023-01	A12	11/23/16	09:41
1611123-DUP2	Duplicate	11/23/16	09:45
1611139-SRD1	Serial Dilution	11/23/16	09:48
1611123-SRM2	Reference	11/23/16	09:51
1611123-MS2	Matrix Spike	11/23/16	09:54
C161023-04	CC02D	11/23/16	09:57
C161023-07	M12C	11/23/16	10:00
1611139-CCV2	Calibration Check	11/23/16	10:06
1611139-CCB2	Calibration Blank	11/23/16	10:09

TechLaw
ESAT Region 8 Laboratory
16194 W 45th Drive
Golden, CO 80403
303.312.7047

US EPA CLP
Chain-of-Custody

EVENT: 2016_OCT_Water & Sed_Bonita Peak_A-129.xlsx

Page 1 of 1

Location	Sub Location	Sample Type	Collection	Matrix	Analyses	Preservation	Sample Date	Sample Time	Sampler
CC02D		Field Sample	Grab	Water	Total Recoverable Metals	TR_Plastic pH<2 w HNO3	9/27/2016	11:00	KB
CC02D		Field Sample	Grab	Water	Dissolved Metals + Hardness	DM_pH<2 w/ HNO3 filt 0.45	9/27/2016	11:00	KB
CC02D		Field Sample	Composite	Sediment	TRM_Hg_Soil	TR_Plastic Baggie	9/27/2016	11:48	KB
M12C		Field Sample	Grab	Water	Total Recoverable Metals	TR_Plastic pH<2 w HNO3	9/29/2016	8:51	IB
M12C		Field Sample	Grab	Water	Dissolved Metals + Hardness	DM_pH<2 w/ HNO3 filt 0.45	9/29/2016	8:51	IB
M12C		Field Sample	Composite	Sediment	TRM_Hg_Soil	TR_Plastic Baggie	9/29/2016	9:08	IB
A12		Field Sample	Grab	Water	Total Recoverable Metals	TR_Plastic pH<2 w HNO3	9/28/2016	9:57	IB
A12		Field Sample	Grab	Water	Dissolved Metals + Hardness	DM_pH<2 w/ HNO3 filt 0.45	9/28/2016	9:57	IB
A12		Field Sample	Composite	Sediment	TRM_Hg_Soil	TR_Plastic Baggie	9/28/2016	10:10	IB

Relinquished By (DATE):

 09/30/16

Relinquished By:

Received By (DATE/TIME):

 9/30/16 1600

Received By:

Cooler Temp: _____

ICE: Y N

pH: Y N

Cust. Seals: Y N

COC/Labels Agree: Y N

Containers Intact: Y N



Sample Receipt Form - TLF-51.01

Project: Bonita Peak TDF #: A-129

Date Received: 9/30/16 Time Received: 16:00 By: Jessica Boyles

1	Airbill/shipping documents present?	<input checked="" type="radio"/> Drop Off	Yes	No
2	Custody seals on shipping containers present and intact?	<input checked="" type="radio"/> None	Yes	No
3	Custody seals on sample containers present and intact?	<input checked="" type="radio"/> None	Yes	No
4	Chain of Custody (COC) present?	<input checked="" type="radio"/> Yes	Yes	No
5	COC and sample container information agree?	<input checked="" type="radio"/> Yes	Yes	No
6	Aqueous samples preserved correctly, if required?	N/A	<input checked="" type="radio"/> Yes	No
7	Samples received within holding times for requested analyses?		<input checked="" type="radio"/> Yes	No
8	Sufficient sample volume for requested analyses?		<input checked="" type="radio"/> Yes	No
9	Sample containers intact and not leaking?		<input checked="" type="radio"/> Yes	No
10	Sample containers appropriate for requested analyses?		<input checked="" type="radio"/> Yes	No
11	Samples shipped on ice?		<input checked="" type="radio"/> Yes	No
12	Cooler temperature(s) ≤ 6.0 °C?	N/A	<input checked="" type="radio"/> Yes	No

Cooler #: 1 2 3 4 5

Temperature (°C): 4.1

pH Strip Lot #: HC123184

Preservation Name and Lot #: N/A

Comments and Additional Information: N/A

Client notified of anomalies, if necessary?	<input checked="" type="radio"/> N/A	Yes	No
Anomalies noted in case narrative and data qualified, if necessary ?	<input checked="" type="radio"/> N/A	Yes	No

1/16/10 23

ESAT Technical Direction Form

Contract No. EPW13028

EPA Region 8

Site ID: A8M5

Date Issued: 9/15/2016

Date

TDF ID: A-129

Date Updated: 9/29/2016

Closed By:

6ct.

Name: Bonita Peak 2016 Eco Risk Analytical Support

Details: The Contractor shall analyze several water, sediment and tissues samples as part of the ecological risk assessment at the Bonita Peak Mining District Superfund site. The water samples will be analyzed for the following as indicated on the COCs:

Dissolved (including hardness) and Total Recoverable Metals (ESAT)
Total Chromium (ESAT)
Total Uranium (ESAT)
Anions (ESAT)
Nitrate (ESAT)
Nitrite (ESAT)
pH-porewaters (ESAT)
Cyanide (CLP)
Dioxins/Furans (CLP)
Semivolatiles (CLP)
Pesticides (CLP)
Aroclors (CLP)
Hexavalent Chromium (Sub)
Radium 226/228 (Sub)
Gross Alpha and Gross Beta (Sub)
Isotopic Uranium (Sub)
Nitrogen, Total Kjeldahl (Sub)
Nitrogen, Ammonia (Sub)

The sediment samples will be analyzed for the following as indicated on the COCs:

Total Metals using same analyte list reported for the waters (ESAT)
Mercury (ESAT)
Total Thallium (ESAT)
Total Uranium (ESAT)
Cyanide (CLP)
Dioxins/Furans (CLP)
Semivolatiles (CLP)
Aroclors (CLP)
Pesticides (CLP)
Radium 226/228 (Sub)
Gross Alpha and Gross Beta (Sub)
Isotopic Uranium (Sub)
Nitrate (Sub)
Nitrite (Sub)

The tissue samples will be analyzed for the following as indicated on the COCs:

Total Metals using same analyte list reported for the waters (ESAT)
Mercury (ESAT)

All the samples designated for the CLP will be processed per the CLP Laboratory Assignment for Case 46488. The CLP Laboratory Assignment will be sent to ESAT by Don Goodrich or SMO/CLP approximately 1-2 weeks prior to the sampling event.

Note: pH is only required for the porewaters

Site RPMs are Rebecca Thomas and Jamie Miller

TO02/Subtask 02b: Inorganic Chemistry
TO02/Subtask 02i: Non-standard Analyses

Analytical Information:

MATRIX

Water Soils Vegetation Biota

WET CHEM

TSS TDS DOC Alk Chloride Sulfate Fluoride Nitrate Nitrite

Other pH on porewaters, ***NO₂ and NO₃ separate

METALS

Dissolved Total Recoverable Total Hardness (Calc)

200.7: Ag Al As Ba Be B Ca Cd Co Cr Cu Fe K Mg

Mn Mo Na Ni Pb Sb Se Sr Ti Tl V Zn SiO₂

200.8: Ag Al As Ba Be Cd Co Cr Cu Mn Mo Ni Pb Sb

Se Th Tl U V Zn

7470/7471/747 Hg

JV
11/22/16

FIBERS

PLM TEM

Deliverables

<i>ID</i>	<i>Description</i>	<i>Due Date</i>	<i>Submission Date</i>
1	Provide final deliverable package to Task Monitor no later than 45 days after delivery of final sample(s).		
2	Provide final deliverable package to Task Monitor no later than 45 days after delivery of final sample(s).		
3	Provide final deliverable package to Task Monitor no later than 45 days after delivery of final sample(s).		
4	Provide final deliverable package to Task Monitor no later than 45 days after delivery of final sample(s).		
5	Provide final deliverable package to Task Monitor no later than 45 days after delivery of final sample(s).		

TLF-07.01	SOP: QAQ-04.00	Eff. Date: 1/17/2007
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ESAT Region 8

Final Report Review Form

LIMS: C161023	Project: <i>Bonita Beach waters & Sedts. Oct 2016</i>
TDF: A-129	Due Date: 10/19/2016

QA/QC Review – Level III

Compare TDF to performed analysis / Ensure all analyses are complete	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Review each Analytical Data Review form noting discrepancies for narrative	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Examine each analytical sequence in LIMS using Data Entry Review application	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Generate draft report, print QC section	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Confirm presence of each analytical batch, QC samples	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Examine analytical results (Form I) for accuracy and completeness	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Check spike recoveries of LCSs, matrix spikes and post-digestion spikes	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Verify serial dilution %D and duplicate RPD for each metals batch	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Narrative Comments

None.

Review By: <i>[Signature]</i>	Date: 10-19-2016
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ESAT Management Review – Level IV

All analytical data and deliverable review forms present and complete	<input type="checkbox"/> Yes <input type="checkbox"/> No
COC copy, received temp. noted, preservatives noted, signature present, holding times met	<input type="checkbox"/> Yes <input type="checkbox"/> No
Copy of TDF present, Analytical requirements met	<input type="checkbox"/> Yes <input type="checkbox"/> No
Case narrative checked for spelling, grammar, technical content and completeness	<input type="checkbox"/> Yes <input type="checkbox"/> No
10% Validation of raw data to reported data on Form Ones	<input type="checkbox"/> Yes <input type="checkbox"/> No
Standard Traceability COAs and ICP / ICP-MS MDL forms present	<input type="checkbox"/> Yes <input type="checkbox"/> No
Final Report cover letter including DCN present	<input type="checkbox"/> Yes <input type="checkbox"/> No
Deficiencies noted requiring correction before delivery to EPA Project Officer	<input type="checkbox"/> Yes <input type="checkbox"/> No

Manager Review Comments

Review By:	Date:
Corrections By:	Date: